

155 FERC ¶ 61,141
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Norman C. Bay, Chairman;
Cheryl A. LaFleur, Tony Clark,
and Colette D. Honorable.

Cameron LNG, LLC

Docket No. CP15-560-000

ORDER GRANTING AUTHORIZATION UNDER SECTION 3 OF THE
NATURAL GAS ACT

(Issued May 5, 2016)

1. On September 28, 2015, Cameron LNG, LLC (Cameron) filed an application for authority under section 3 of the Natural Gas Act (NGA)¹ to site, construct, and operate certain additional facilities for the liquefaction and export of domestically-produced natural gas (Expansion Project) at its existing liquefied natural gas (LNG) terminal in Cameron and Calcasieu Parishes, Louisiana. For the reasons discussed below, the Commission grants Cameron's requested authorizations, subject to conditions.

I. Background

2. Cameron,² a Delaware limited liability company, operates an LNG terminal on the west side of the Calcasieu Ship Channel in Cameron and Calcasieu Parishes, Louisiana.³ Originally, Cameron was authorized to import, store, and deliver LNG to domestic markets. Subsequently, the Commission additionally authorized Cameron to operate the LNG terminal to export LNG that had been previously imported and stored at the LNG terminal to foreign markets.⁴ In 2014, the Commission authorized Cameron to site, construct, and operate additional facilities at the LNG terminal in order to liquefy and

¹ 15 U.S.C. § 717b (2012).

² Cameron was previously known as Hackberry LNG, L.L.C.

³ *Hackberry LNG Terminal, L.L.C.*, 101 FERC ¶ 61,294 (2002), *order on reh'g*, *Cameron LNG, LLC*, 104 FERC ¶ 61,269 (2003).

⁴ *Cameron LNG, LLC*, 134 FERC ¶ 61,049 (2011).

export up to 772 billion cubic feet (Bcf) of domestically-produced natural gas or the equivalent of 14.95 million metric tons per annum (MMTPA) of LNG (Liquefaction Project).⁵ Specifically, the Liquefaction Project facilities consist of a fourth LNG storage tank, three liquefaction trains (Trains 1, 2, and 3), and associated natural gas pre-treatment equipment at the existing LNG terminal. Cameron is currently constructing these facilities.

II. Proposal

3. Cameron proposes to construct and operate a fifth 160,000-cubic meter (m³) LNG storage tank, which would store LNG pending export, and two additional liquefaction trains (Trains 4 and 5). Each proposed train would have a liquefaction capability of 4.985 MMTPA. Each liquefaction train will contain: (1) a unit to remove carbon dioxide, hydrogen sulfide, water, and mercury from the feed gas; (2) a unit to remove heavy hydrocarbons from the feed gas; and (3) a liquefaction unit to cool and liquefy the natural gas. The design of these trains is identical to the design of the three other trains currently being constructed at the LNG terminal. The two additional trains would utilize the refrigerant storage that the Commission previously authorized for the Liquefaction Project. Cameron also proposes to construct and operate a condensate product storage tank⁶ and associated utilities and infrastructure consisting of two new boil-off gas compressors to be used during the liquefaction process, three 2.5-megawatt diesel engine backup generators, a diesel storage tank, and a new demineralized water system.

4. The proposed Expansion Project would allow Cameron to export an additional 515 Bcf per year of domestically-produced natural gas or the equivalent of 9.97 MMTPA of LNG from its existing LNG terminal. The proposals would increase the LNG terminal's export capability to approximately 1.29 trillion cubic feet per year of domestically-produced natural gas or 24.92 MMTPA of LNG.

5. Cameron states that its LNG terminal will receive gas for the Expansion Project via an existing interconnection with Cameron Interstate Pipeline, LLC's pipeline and a recently certificated interconnection with Columbia Gulf Transmission, LLC.⁷

⁵ *Cameron LNG, LLC*, 147 FERC ¶ 61,230 (2014).

⁶ Cameron proposes to condense the heavy hydrocarbons removed from feed gas and store and transport the stabilized condensate product for sale by trucks or pipeline. The condensate product storage tank would supplement the two identical tanks that the Commission authorized in the Liquefaction Project proceeding. Cameron also proposes to install a second loading arm to load and unload condensate product.

⁷ *Columbia Gulf Transmission, LLC*, 152 FERC ¶ 61,214 (2015).

6. Cameron proposes to construct the Expansion Project concurrently with the Liquefaction Project. The Expansion Project will be located entirely within the existing Cameron LNG terminal boundaries.

III. Notice, Interventions, and Comments

7. Notice of Cameron's application was published in the *Federal Register* on October 20, 2015, with interventions, comments, and protests due on or before November 3, 2015.⁸ Lake Charles LNG Export Company, LLC, Lake Charles LNG Company, LLC, Trunkline Gas Company, LLC (joint motion), and Magnolia LNG LLC filed timely, unopposed motions to intervene. Timely, unopposed motions to intervene are granted by operation of Rule 214(c) of the Commission's Rules of Practice and Procedure.⁹

8. The motions to intervene included comments about vessel traffic caused by project operations. The environmental assessment (EA) addresses these comments.¹⁰

IV. Discussion

A. Public Interest Standard

9. Because the proposed LNG liquefaction facilities will be used to export natural gas to foreign countries, the siting, construction, and operation of the proposed facilities require approval by the Commission under section 3 of the NGA.¹¹ While section 3 provides that an application shall be approved unless the proposal "will not be consistent

⁸ 80 Fed. Reg. 63,551 (2015).

⁹ 18 C.F.R. § 385.214(c) (2015).

¹⁰ See EA at 5.

¹¹ The regulatory functions of section 3 of the NGA were transferred to the Secretary of Energy in 1977 pursuant to section 301(b) of the Department of Energy Organization Act, 42 U.S.C. § 7151(b) (2012). Pursuant to sections 642 and 402(e) of the Act, 42 U.S.C. §§ 7252 and 7172(e), the Secretary of Energy subsequently delegated to the Commission the authority to approve or disapprove the construction and operation of natural gas import and export facilities and the site at which such facilities shall be located. The most recent delegation is in DOE Delegation Order No. 00-044.00A, effective May 16, 2006. The Commission does not authorize importation or exportation of the commodity itself.

with the public interest,”¹² section 3 also provides that an application may be approved “in whole or in part, with such modification and upon such terms and conditions as the Commission may find necessary or appropriate.”¹³

10. Construction and operation of Cameron’s Expansion Project will be located entirely within the footprint of Cameron’s existing LNG terminal. The affected and adjacent lands are used for industrial purposes.¹⁴ As a result, the environmental impacts of the Expansion Project are expected to be few and well-defined.¹⁵

11. We conclude that, with the conditions required herein, Cameron’s Expansion Project results in minimal environmental impacts and can be constructed and operated safely. Accordingly, we find that, subject to the conditions imposed in this order, Cameron’s proposals are not inconsistent with the public interest.¹⁶

B. Environmental Analysis

12. On March 2, 2015, in Docket No. PF15-13-000, Commission staff began its environmental review of the proposed project after granting Cameron’s request to use the pre-filing process. As part of the pre-filing review, on June 18, 2015, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment* (NOI). The NOI was mailed to interested parties including federal, state, and local officials; agency representatives; environmental and public interest groups; Native American tribes; local libraries and newspapers; and affected property owners.

¹² 15 U.S.C. § 717b(a) (2012).

¹³ *Id.* See, e.g., *Distrigas Corp. v. FPC*, 495 F.2d 1057, 1063-64 (D.C. Cir. 1974), *cert. denied*, 419 U.S. 834 (1974); *Dynegy LNG Production Terminal, L.P.*, 97 FERC ¶ 61,231 (2001) (discussing the Commission’s authority to condition its approvals of facilities under section 3 of the NGA).

¹⁴ See EA at 23.

¹⁵ See *id.* at 118.

¹⁶ See also DOE Order No. 3680 (July 10, 2015) (FE Docket No. 15-36-LNG) (DOE finding that exporting 515 Bcf of natural gas per year from Cameron’s Expansion Project to free trade agreement (FTA) nations would not be inconsistent with the public interest); Cameron’s May 28, 2015 application to export 515 Bcf of natural gas per year from the Expansion Project to non-FTA nation is still pending before the DOE (FE Docket No. 15-90-LNG).

13. We received comments in response to the NOI from the Louisiana Department of Wildlife and Fisheries, U.S. Department of Defense, and U.S. Environmental Protection Agency. The Louisiana Department of Wildlife and Fisheries had no objections to the Expansion Project. The U.S. Department of Defense stated that the project would likely only have minimal impacts on its training and operations. The Environmental Protection Agency commented on the purpose and need of the project, alternatives, water supply and quality, groundwater, stormwater, biological resources, air quality, hazardous materials, indirect effects, coordination with tribal governments, the National Historic Preservation Act, environmental justice, and land use planning.

14. To satisfy the requirements of the National Environmental Policy Act of 1969, our staff prepared an EA for Cameron's proposal.¹⁷ The EA was prepared with the cooperation of the U.S. Department of Energy and U.S. Department of Transportation. The analysis in the EA addresses geology, groundwater, surface water and aquatic resources, wildlife, threatened and endangered species, land use, recreation, visual resources, cultural resources, air quality, noise, safety, socioeconomics, cumulative impacts, and alternatives. All substantive comments received in response to the NOI were addressed in the EA. The EA was placed into the public record on February 12, 2016. No comments were filed in response to the EA. However, Environmental Conditions 10 and 63 have been added in the appendix to this order to further clarify that authorization from the Director of the Office of Energy Projects will be required prior to the introduction of hazardous fluids into the Expansion Project facilities and loading of the initial cargoes of LNG during commissioning activities, as well to require Cameron to file weekly reports to document the commissioning process.

15. Based on the analysis in the EA, we conclude that if constructed and operated in accordance with Cameron's application and supplements, and in compliance with the environmental conditions in the appendix to this order, our approval of this proposal would not constitute a major federal action significantly affecting the quality of the human environment.

16. Any state or local permits issued with respect to the jurisdictional facilities authorized herein must be consistent with the conditions of this certificate. The Commission encourages cooperation between interstate pipelines and local authorities. However, this does not mean that state and local agencies, through application of state or

¹⁷ 42 U.S.C. §§ 4321 *et seq.* (2012). *See also* 18 C.F.R. pt. 380 (2015) (Commission's regulations implementing NEPA).

local laws, may prohibit or unreasonably delay the construction or operation of facilities approved by this Commission.¹⁸

17. The Commission on its own motion received and made part of the record in this proceeding all evidence, including the application, as supplemented, and exhibits thereto, and all comments submitted herein, and upon consideration of the record,

The Commission orders:

(A) Cameron is authorized under section 3 of the NGA to site, construct, and operate the proposed project located in Cameron and Calcasieu Parishes, Louisiana, as described and conditioned herein, and as fully described in Cameron's application and supplements, subject to the environmental conditions contained in the appendix of this order.

(B) Cameron's proposed project shall be constructed and made available for service within 4 years of the date of this order.

(C) Cameron shall notify the Commission's environmental staff by telephone, e-mail, and/or facsimile of any environmental noncompliance identified by other federal, state, or local agencies on the same day that such agency notifies Cameron. Cameron shall file written confirmation of such notification with the Secretary of the Commission within 24 hours.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.

¹⁸ See, e.g., *Schneidewind v. ANR Pipeline Co.*, 485 U.S. 293 (1988); *Dominion Transmission, Inc. v. Summers*, 723 F.3d 238, 243 (D.C. Cir. 2013) (holding state and local regulation is preempted by the NGA to the extent it conflicts with federal regulation, or would delay the construction and operation of facilities approved by the Commission); *Iroquois Gas Transmission System, L.P.*, 52 FERC ¶ 61,091 (1990) and 59 FERC ¶ 61,094 (1992).

Appendix

Environmental Conditions

As recommended in the EA, this authorization includes the following conditions:

1. Cameron shall follow the construction procedures and mitigation measures described in their application and supplements, including responses to staff data requests and as identified in the EA, unless modified by the order. Cameron must:
 - a. request any modification to these procedures, measures, or conditions in a filing with the Secretary of the Commission (Secretary);
 - b. justify each modification relative to site-specific conditions;
 - c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
 - d. receive approval in writing from the Director of the Office of Energy Projects (OEP) before using that modification.
2. The Director of OEP has delegated authority to take all steps necessary to ensure the protection of life, health, property, and the environment during construction and operation of the Expansion Project. This authority shall include:
 - a. stop-work authority and authority to cease operation; and
 - b. the design and implementation of any additional measures deemed necessary to assure continued compliance with the intent of the environmental conditions of the order.
3. **Prior to any construction**, Cameron shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, environmental inspectors (EI), and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.
4. The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, Cameron shall file with the Secretary any revised detailed survey maps/sheets at a scale not smaller than 1:6,000 with station positions for the facility authorized by the order. All requests for modifications of environmental conditions of the order or site-specific clearances must be written and must specify locations designated on these alignment maps/sheets.

5. Cameron shall file with the Secretary detailed maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all facility relocations, staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed that have not been previously identified in filings with the Secretary. Approval for use of each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps, or aerial photographs. Each area must be approved in writing by the Director of OEP **before construction in or near that area.**

This requirement does not apply to route variations required herein or extra workspace allowed by the Commission's Upland Erosion Control, Revegetation, and Maintenance Plan. Examples of alterations requiring approval include all facility location changes resulting from:

- a. implementation of cultural resources mitigation measures;
 - b. implementation of endangered, threatened, or special concern mitigation measures;
 - c. recommendations by state regulatory authorities; and
 - d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.
6. **Within 60 days of the acceptance of the authorization and before construction** begins, Cameron shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Cameron must file revisions to the plan as schedules change. The plan shall identify:
 - a. how Cameron will implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the order;
 - b. how Cameron will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;
 - c. the number of EIs assigned, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;
 - d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;

- e. the location and dates of the environmental compliance training and instructions Cameron will give to all personnel involved with construction and restoration (initial and refresher training as the Expansion Project progresses and personnel change);
 - f. the company personnel (if known) and specific portion of Cameron's organization having responsibility for compliance;
 - g. the procedures (including use of contract penalties) Cameron will follow if noncompliance occurs; and
 - h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:
 - (1) the completion of all required surveys and reports;
 - (2) the environmental compliance training of onsite personnel;
 - (3) the start of construction; and
 - (4) the start and completion of restoration.
7. Cameron shall employ at least one EI during construction of the Expansion Project. The EI shall be:
- a. responsible for monitoring and ensuring compliance with all mitigation measures required by the order and other grants, permits, certificates, or other authorizing documents;
 - b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
 - c. empowered to order correction of acts that violate the environmental conditions of the order, and any other authorizing document;
 - d. a full-time position, separate from all other activity inspectors;
 - e. responsible for documenting compliance with the environmental conditions of the order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
 - f. responsible for maintaining status reports.
8. Beginning with the filing of its Implementation Plan, Cameron shall file updated status reports with the Secretary on a **monthly** basis until all construction and restoration activities are complete. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:
- a. an update on Cameron efforts to obtain the necessary federal authorizations;

- b. the construction status of the Expansion Project, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally-sensitive areas;
 - c. a listing of all problems encountered and each instance of noncompliance observed by the EI during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);
 - d. a description of the corrective actions implemented in response to all instances of noncompliance, and their cost;
 - e. the effectiveness of all corrective actions implemented;
 - f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the order, and the measures taken to satisfy their concerns; and
 - g. copies of any correspondence received by Cameron from other federal, state, or local permitting agencies concerning instances of noncompliance, and Cameron's response.
9. **Prior to receiving written authorization from the Director of OEP to commence construction of any project facilities**, Cameron shall file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).
10. Cameron must receive written authorization from the Director of OEP **prior to introducing hazardous fluids into the Expansion Project facilities**. Instrumentation and controls, hazard detection, hazard control, and security components/systems necessary for the safe introduction of such fluids shall be installed and functional.
11. Cameron must receive written authorization from the Director of OEP **before placing into service** the phases of the Expansion Project. Such authorization will only be granted following a determination that the facilities have been constructed in accordance with the Commission's approval and applicable standards, can be expected to operate safely as designed, and the rehabilitation and restoration of the right-of-way and other areas affected by the Expansion Project are proceeding satisfactorily.

12. **Within 30 days of placing the authorized facilities in service**, Cameron shall file an affirmative statement with the Secretary, certified by a senior company official:
- a. that the facilities have been installed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
 - b. identifying which of the conditions in the order Cameron has complied with or will comply with. This statement shall also identify any areas affected by the Expansion Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.
13. Cameron shall file with the Secretary the following information, stamped and sealed by a professional engineer-of-record licensed in Louisiana:
- a. quality control procedures that will be used for design and construction prior to initial site preparation;
 - b. site preparation drawings and specifications prior to construction of the final design;
 - c. LNG storage tank and foundation design drawings and calculations prior to construction of the final design;
 - d. LNG liquefaction structures and foundation design drawings and calculations prior to their construction of the final design; and
 - e. seismic specifications used in conjunction with the procuring equipment prior to construction of the final design.

In addition, Cameron shall file, in its Implementation Plan, the schedule for producing this information.

14. Cameron shall file a full load noise survey with the Secretary **no later than 60 days** after placing each of the liquefaction trains (Trains 4 and 5) into service. If a full load noise survey is not possible, Cameron shall provide an interim survey at the maximum possible load and provide the full load survey **within six months**. If the noise attributable to operation of all the equipment at the Cameron Terminal, under interim or full load conditions, exceeds a day/night sound level of 55 decibels on the A-weighted scale at any nearby noise sensitive area, Cameron shall file a report on the changes that are needed and shall install the additional noise controls to meet the level **within one year** of the in-service date. Cameron shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.

The following measures shall apply to Cameron's Expansion Project. Information pertaining to these specific conditions shall be filed with the Secretary for review and written approval by the Director of OEP either: **prior to initial site preparation; prior to construction of final design; prior to commissioning; prior to introduction of hazardous fluids; or prior to commencement of service**, as indicated by each specific condition. Specific engineering, vulnerability, or detailed design information meeting the criteria specified in Order No. 683 (Docket No. RM06-24-000), including security information, shall be submitted as critical energy infrastructure information pursuant to 18 CFR 388.112. *See* Critical Energy Infrastructure Information, Order No. 683, 71 Fed. Reg. 58,273 (Oct. 3, 2006), FERC Stats. & Regs. ¶ 31,228 (2006). Information pertaining to items such as: offsite emergency response; procedures for public notification and evacuation; and construction and operating reporting requirements, would be subject to public disclosure. All information shall be filed **a minimum of 30 days** before approval to proceed is requested.

15. **Prior to initial site preparation**, Cameron shall file an overall project schedule, which includes the proposed stages of the commissioning plan.
16. **Prior to initial site preparation**, Cameron shall provide procedures for controlling access during construction.
17. **Prior to initial site preparation**, Cameron shall file the quality assurance and quality control procedures for construction activities.
18. **Prior to initial site preparation**, Cameron shall file with the Secretary, for review and written approval by the Director of OEP, additional analysis that demonstrates the flammable vapor dispersion from design spills would be prevented from dispersing underneath the existing elevated LNG storage tank(s), or the LNG storage tank(s) would be able to withstand an overpressure due to ignition of the flammable vapor dispersion cloud that disperses underneath the existing elevated LNG storage tank(s).
19. **Prior to initial site preparation**, Cameron shall file with the Secretary, for review and written approval by the Director of OEP, an analysis that demonstrates the fire protection system, refrigerant storage tanks, refrigerant trucks, and occupied building will be designed to withstand the overpressures due to mixed refrigerant vapor cloud explosions.

20. **Prior to initial site preparation**, Cameron shall file updates to the Emergency Response Plan (ERP) to include the Expansion Project, as well as instructions to handle on-site refrigerant and NGL-related emergencies.
21. **Prior to initial site preparation**, Cameron shall file an ERP that includes a Cost-Sharing Plan identifying the mechanisms for funding all Expansion Project-specific security/emergency management costs that will be imposed on state and local agencies. In addition to the funding of direct transit-related security/emergency management costs, this comprehensive plan shall include funding mechanisms for the capital costs associated with any necessary security/emergency management equipment and personnel base.
22. The **final design** shall include certification that the design for Trains 4 and 5 and Storage Tank 5 would duplicate Trains 1 through 3 and Storage Tank 4, and how the conditions from the June 19, 2014 Order (Docket No. CP13-25-000) will be incorporated in the design for Trains 4 and 5 and Storage Tank 5.
23. The **final design** shall include information/revisions pertaining to Cameron's response numbers 7 and 8 of its December 16, 2015 filing, which indicated features to be included or considered in the final design.
24. The **final design** shall include certification that the final design is consistent with the information provided to U.S. Department of Transportation (DOT) as described in the design spill determination letter dated December 24, 2015 (Accession Number 20151228-4001). In the event that any modifications to the design alters the candidate design spills on which the 49 C.F.R. Part 193 siting analysis was based, Cameron shall consult with DOT on any actions necessary to comply with Part 193.
25. The **final design** shall include a plot plan showing all major equipment, structures, buildings, and impoundment systems.
26. The **final design** shall include procedures to maintain and inspect the barriers provided to meet the siting provisions of 49 C.F.R. § 193.2059.
27. The **final design** shall include plan and drawings to detect and notify plant personnel of asphyxiate hazards due to releases of liquid nitrogen and other hazardous fluids.
28. The **final design** shall include change logs that list and explain any changes made from the front-end engineering design provided in Cameron's application and filings. A list of all changes with an explanation for the design alteration shall be provided and all changes shall be clearly indicated on all diagrams and drawings.

29. The **final design** shall provide up-to-date Process Flow Diagrams with heat and material balances and Piping and Instrument Diagrams (P&ID), which include the following information:
- a. equipment tag number, name, size, duty, capacity, and design conditions;
 - b. equipment insulation type and thickness;
 - c. storage tank pipe penetration size and nozzle schedule;
 - d. valve high pressure side and internal and external vent locations;
 - e. piping with line number, piping class specification, size, and insulation type and thickness;
 - f. piping specification breaks and insulation limits;
 - g. all control and manual valves numbered;
 - h. relief valves with set points; and
 - i. drawing revision number and date.
30. The **final design** shall provide P&IDs, specifications, and procedure that clearly show and specify the tie-in details required to safely connect the Expansion Project to the existing facility.
31. The **final design** shall provide an up-to-date complete equipment list, process and mechanical data sheets, and specifications.
32. The **final design** shall include three-dimensional plant drawings to confirm plant layout for maintenance, access, egress, and congestion.
33. The **final design** shall include a list of all car-sealed and locked valves consistent with the P&IDs.
34. The **final design** shall include drawings of the storage tank piping support structure and support of horizontal piping at grade including pump columns, relief valves, pipe penetrations, instrumentation, and appurtenances.
35. The **final design** shall include the structural analysis of the LNG storage tank and outer containment demonstrating they are designed to withstand all loads and combinations as well as all thermal and overpressure loads incurred from release and ignition of a design spill and coincident and adjacent roof tank top fires.
36. The **final design** shall demonstrate that for hazardous fluids, piping and piping nipples two inches or less in diameter are designed to withstand external loads, including vibrational loads in the vicinity of rotating equipment and operator live loads in areas accessible by operators.

37. The **final design** shall provide the procedures for pressure/leak tests which address the requirements of American Society of Mechanical Engineers (ASME) VIII and ASME B31.3, as required by 49 C.F.R. Part 193.
38. The **final design** shall include a plan for clean-out, dry-out, purging, and tightness testing. This plan shall address the requirements of the American Gas Association's Purging Principles and Practice required by 49 C.F.R. Part 193 and shall provide justification if not using an inert or non-flammable gas for cleanout, dry-out, purging, and tightness testing.
39. The **final design** shall include drawings and details of how process seals or isolations installed at the interface between a flammable fluid system and an electrical conduit or wiring system meet the requirements of National Fire Prevention Association (NFPA) Standard 59A.
40. The **final design** shall provide an air gap or vent installed downstream of process seals or isolations installed at the interface between a flammable fluid system and an electrical conduit or wiring system. Each air gap shall vent to a safe location and be equipped with a leak detection device that: shall continuously monitor for the presence of a flammable fluid; shall alarm the hazardous condition; and shall shut down the appropriate systems.
41. The **final design** shall provide electrical area classification drawings.
42. The **final design** shall include a hazard and operability review of the completed design prior to issuing the P&IDs for construction. A copy of the review, a list of recommendations, and actions taken on the recommendations, shall be filed.
43. The **final design** shall include the cause-and-effect matrices for the process instrumentation, fire and gas detection system, and emergency shutdown system. The cause-and-effect matrices shall include alarms and shutdown functions, details of the voting and shutdown logic, and setpoints.
44. The **final design** shall include a drawing showing the location of the emergency shut-down (ESD) buttons. The ESD buttons shall be easily accessible, conspicuously labeled and located in an area which would be accessible during an emergency.
45. The **final design** shall specify that all ESD valves are to be equipped with open and closed position switches connected to the Distributed Control System/Safety Instrumented System.

46. The **final design** shall include the sizing basis and capacity for the final design of flare stack as well as the pressure and vacuum relief valves for major process equipment, vessels, and storage tanks.
47. The **final design** shall include an updated fire protection evaluation of the proposed facilities carried out in accordance with the requirements of NFPA Standard 59A 2001, chapter 9.1.2, as required by 49 C.F.R. Part 193. A copy of the evaluation, a list of recommendations and supporting justifications, and actions taken on the recommendations shall be filed.
48. The **final design** shall provide spill containment system drawings with dimensions and slopes of curbing, trenches, and impoundments.
49. The **final design** shall provide complete plan drawings and a list of the hazard detection equipment. The drawings shall clearly show the location and elevation of all detection equipment. The list shall include the instrument tag number, type and location, alarm locations, and shutdown functions of the proposed hazard detection equipment.
50. The **final design** shall include a list of alarm and shutdown set points for all flammable detectors that account for the calibration gas when determining the set points for flammable components such as refrigerants, natural gas liquids, and LNG.
51. The **final design** shall include a list of alarm and shutdown set points for all toxic detectors that account for the calibration gas when determining the set points for toxic components such as benzene, toluene, ethylbenzene and xylenes.
52. The **final design** shall provide complete plan drawings and a list of the fixed and wheeled dry-chemical, hand-held fire extinguishers, and other hazard control equipment. Drawings shall clearly show the location by tag number of all fixed, wheeled, and hand-held extinguishers. The list shall include the equipment tag number, type, capacity, equipment covered, and automatic and manual remote signals initiating discharge of the units.
53. The **final design** shall provide facility plans and drawings that show the location of the firewater and foam systems. Drawings shall clearly show: firewater and foam piping; post indicator valves; and the location of and area covered by each monitor, hydrant, deluge system, foam system, water-mist system, and sprinkler. The drawings shall also include piping and instrumentation diagrams of the firewater and foam system.

54. **Prior to commissioning**, Cameron shall provide a detailed schedule for commissioning through equipment startup. The schedule shall include milestones for all procedures and tests to be completed: prior to introduction of hazardous fluids; and during commissioning and startup. Cameron shall file documentation certifying that each of these milestones has been completed before authorization to commence the next phase of commissioning and startup will be issued.
55. **Prior to commissioning**, Cameron shall file plans and detailed procedures for: testing the integrity of onsite mechanical installation; functional tests; introduction of hazardous fluids; operational tests; and placing the equipment into service.
56. **Prior to commissioning**, Cameron shall tag all equipment, instrumentation, and valves in the field, including drain valves, vent valves, main valves, and car-sealed or locked valves.
57. **Prior to commissioning**, Cameron shall provide results of the LNG storage tank hydrostatic test and foundation settlement results. At a minimum, foundation settlement results shall be provided thereafter annually.
58. **Prior to commissioning**, Cameron shall file updates addressing the Expansion Project facilities in the operation and maintenance procedures and manuals, as well as safety procedures.
59. **Prior to commissioning**, Cameron shall maintain a detailed training log to demonstrate that operating staff has completed the required training.
60. **Prior to commissioning**, Cameron shall file a tabulated list and drawings of the proposed hand-held fire extinguishers. The list shall include the equipment tag number, extinguishing agent type, capacity, number, and location. The drawings shall show the extinguishing agent type, capacity, and tag number of all hand-held fire extinguishers.
61. **Prior to introduction of hazardous fluids**, Cameron shall complete all pertinent tests (Factory Acceptance Tests, Site Acceptance Tests, Site Integration Tests) associated with the Distributed Control System and the Safety Instrumented System that demonstrates full functionality and operability of the system.
62. **Prior to introduction of hazardous fluids**, Cameron shall complete a firewater pump acceptance test and firewater monitor and hydrant coverage test. The actual coverage area from each monitor and hydrant shall be shown on facility plot plan(s).

63. **Prior to unloading the first LNG import commissioning cargo and prior to loading the first LNG export commissioning cargo**, Cameron shall receive written authorization from the Director of OEP. After the loading or unloading of the first cargo, Cameron shall file **weekly** reports on the commissioning of the proposed systems that detail the progress toward demonstrating the facilities can safely and reliably operate at or near the design production rate. The reports shall include a summary of activities, problems encountered, and remedial actions taken. The weekly reports shall also include the latest commissioning schedule, including projected and actual LNG production by each liquefaction train, LNG storage inventories in each storage tank, and the number of anticipated and actual LNG commissioning cargoes, along with the associated volumes loaded or unloaded. Further, the weekly reports shall include a status and list of all planned and completed safety and reliability tests, work authorizations, and punch list items. Problems of significant magnitude shall be reported to the FERC **within 24 hours**.
64. **Prior to commencement of service**, Cameron shall develop procedures for offsite contractors' responsibilities, restrictions, and limitations and for supervision of these contractors by Cameron staff.
65. **Prior to commencement of service**, Cameron shall label piping with fluid service and direction of flow in the field in addition to the pipe labeling requirements of NFPA Standard 59A.
66. **Prior to commencement of service**, Cameron shall specify an alarm management program to ensure effectiveness of process alarms.
67. **Prior to commencement of service**, Cameron shall notify Commission staff of any proposed developments to the security plan of the facility.
68. **Prior to commencement of service**, progress on the construction of the proposed systems shall be reported in **monthly** reports filed with the Secretary. Details shall include a summary of activities, problems encountered, contractor non-conformance/deficiency logs, remedial actions taken, and current Expansion Project schedule. Problems of significant magnitude shall be reported to the Commission **within 24 hours**.

In addition, the following measures shall apply throughout the life of the facility:

69. The facility shall be subject to regular Commission staff technical reviews and site inspections on at least an **annual basis** or more frequently as circumstances indicate. Prior to each Commission staff technical review and site inspection,

Cameron shall respond to a specific data request, including information relating to possible design and operating conditions that may have been imposed by other agencies or organizations. Up-to-date detailed piping and instrumentation diagrams reflecting facility modifications and provision of other pertinent information not included in the semi-annual reports described below, including facility events that have taken place since the previously submitted semi-annual report, shall be submitted.

70. Semi-annual operational reports shall be filed with the Secretary to identify changes in facility design and operating conditions, abnormal operating experiences, activities (including ship arrivals, quantity and composition of imported and exported LNG, liquefied and vaporized quantities, boil-off/flash gas, etc.), plant modifications, including future plans and progress thereof. Abnormalities shall include, but not be limited to: unloading/loading/shipping problems, potential hazardous conditions from off-site vessels, storage tank stratification or rollover, geysering, storage tank pressure excursions, cold spots on the storage tanks, storage tank vibrations and/or vibrations in associated cryogenic piping, storage tank settlement, significant equipment or instrumentation malfunctions or failures, non-scheduled maintenance or repair (and reasons therefore), relative movement of storage tank inner vessels, hazardous fluid releases, fires involving hazardous fluids, negative pressure (vacuum) within a storage tank and higher than predicted boil-off rates. Adverse weather conditions and the effect on the facility also shall be reported. Reports shall be submitted **within 45 days after each period ending June 30 and December 31**. In addition to the above items, a section entitled "Significant Plant Modifications Proposed for the Next 12 Months (dates)" also shall be included in the semi-annual operational reports. Such information will provide Commission staff with early notice of anticipated future construction/maintenance projects at the LNG facility.
71. In the event the temperature of any region of any secondary containment, including imbedded pipe supports, becomes less than the minimum specified operating temperature for the material, the Commission shall be notified **within 24 hours** and procedures for corrective action shall be specified.
72. Significant non-scheduled events, including safety-related incidents (e.g., hazardous fluid releases, fires, explosions, mechanical failures, unusual over pressurization, and major injuries) and security-related incidents (e.g., attempts to enter site, suspicious activities) shall be reported to Commission staff. In the event an abnormality is of significant magnitude to threaten public or employee safety, cause significant property damage, or interrupt service, notification shall be made **immediately**, without unduly interfering with any necessary or appropriate emergency repair, alarm, or other emergency procedure. In all instances,

notification shall be made to Commission staff **within 24 hours**. This notification practice shall be incorporated into the LNG facility's emergency plan. Examples of reportable hazardous fluids-related incidents include:

- a. fire;
- b. explosion;
- c. estimated property damage of \$50,000 or more;
- d. death or personal injury necessitating in-patient hospitalization;
- e. release of hazardous fluids for 5 minutes or more;
- f. unintended movement or abnormal loading by environmental causes, such as an earthquake, landslide, or flood, that impairs the serviceability, structural integrity, or reliability of an LNG facility that contains, controls, or processes hazardous fluids;
- g. any crack or other material defect that impairs the structural integrity or reliability of an LNG facility that contains, controls, or processes hazardous fluids;
- h. any malfunction or operating error that causes the pressure of a pipeline or LNG facility that contains or processes hazardous fluids to rise above its maximum allowable operating pressure (or working pressure for LNG facilities) plus the build-up allowed for operation of pressure limiting or control devices;
- i. a leak in an LNG facility that contains or processes hazardous fluids that constitutes an emergency;
- j. inner tank leakage, ineffective insulation, or frost heave that impairs the structural integrity of an LNG storage tank;
- k. any safety-related condition that could lead to an imminent hazard and cause (either directly or indirectly by remedial action of the operator), for purposes other than abandonment, a 20 percent reduction in operating pressure or shutdown of operation of a pipeline or an LNG facility that contains or processes hazardous fluids;
- l. safety-related incidents occurring at or en route to and from the LNG facility involving hazardous fluids; or
- m. an event that is significant in the judgment of the operator and/or management even though it did not meet the above criteria or the guidelines set forth in an LNG facility's incident management plan.

In the event of an incident, the Director of OEP has delegated authority to take whatever steps are necessary to ensure operational reliability and to protect human life, health, property or the environment, including authority to direct the LNG facility to cease operations. Following the initial company notification, the FERC staff will determine the need for a separate follow-up report or follow-up in the upcoming semi-annual operational report. All company follow-up reports shall include investigation results and recommendations to minimize a reoccurrence of the incident.